gian Academy of Sciences, a translation of which has already been published in this country. The current number for August 20 opens with an article *à propos* of the war, a translation of Prof. Shaw's address to the Military College at Sandhurst on the war establishments of Great Britain. We have then the continuation of M. Marey's paper on the Flight of Birds; and, in conclusion, under the head of "Bibliography," a translation of Mr. Wallace's review of Mr. J. J. Murphy's "Habit and Intelligence," which appeared in our columns.

THE *American Entomologist and Botanist* publishes a double number for July and August, which is occupied by short descriptive articles of interest and value principally to American collectors and students. The article of chief general interest is one on the "Origin of Prairie Vegetation," consisting of an able criticism of Prof. Winchell's theory that the prairies are of lacustrine origin, and that we must look to the source of the prairie vegetation from without,—probably the remains of a preglacial flora, the germs of which have remained stored up during subsequent epochs, and come again to life whenever the diluvial surface is again exposed. The writer of the article maintains that there is no need to go so far back as the diluvial period for the origin of the prairie vegetation. Dr. Hale, of Chicago, mentions the interesting fact that the *Ranunculus cymbalaria*, an abundant plant of the eastern sea coast and of the salt springs in the State of New York, is found in great abundance at Chicago, and for several miles along the shores of Lake Michigan, though nowhere else on the Great Lakes. It appears, however, that it also grows on the muddy banks of some of the western rivers.

THE *Geological Magazine* for the present month (No. 74), contains only three original articles, namely, one by Mr. D. Mackintosh on the Dispersion of Shapfell Boulders, and Origin of Boulder Clay; a second by Mr. John Hopkinson on the structure and affinities of *Dicranograptus* (with a plate), including descriptions and figures of the British species of that genus, two of which (*D. formosus* and *D. nicholsoni*) are described as new; and a memoir, with two plates, by Mr. T. Davidson, on Italian Tertiary Brachiopoda, with an important table of the species and their geological distribution. Among the abstracts and notices of memoirs, is a report of an interesting lecture on the Primæval Rivers of Britain, by Professor T. Rupert Jones.

Mittheilungen aus Justus Perthes' Geographischer Anstalt (vol. xvi., No. 8) opens with a remarkably interesting paper —illustrated by a map—by Dr. G. Nachtigal, on his travels in Tibesti. He says that, in spite of Barth's philological investigations, he regards the question as to the nature of the Tibbu as still undecided. They are of middle height, are very well built, and possess elegant yet muscular limbs. The majority of them are of a deep bronze colour, but without a trace of what is usually termed the negro physiognomy. On the whole, their physical and psychical peculiarities, their social and political arrangements, and their manners and customs, resemble those of the Berber infinitely more than those of the Negro. Amongst other things, Dr. Nachtigal records some careful observations of the rivers Zuar and Marmar, the former of which he regards as incomparably the finest river in Tibesti. In M. Lejean's article on his own travels in European Turkey in 1869, he corrects the existing maps in several points, embodying in an elaborate map the results of his investigations. He expresses the greatest contempt for the modern Turks, intimating that those who believe they have recently made real progress are deceived by mere appearances. He says he has gathered full materials for a work or works on the ethnography and archæology of the districts he describes. Professor Pellegrino Strobel describes a journey from the Planchar Pass to Mendoza; and the rest of the number is made up of "Geographical Notices" and translations of extracts from Mr. Robert Brown's "Physical Geography of the Queen Charlotte Islands," and from reports published in the "South Australian Register," on Mr. G. W. Gogden's Measuring Expedition to North Australia.

SOCIETIES AND ACADEMIES

BRISTOL

Observing Astronomical Society.—Report of observations made by the members during the period from July 7th to August 6th, 1870, inclusive:—*Solar Phenomena.*—Mr. Thomas G. E. Elger, of Bedford, reports that the sun spots observed in July exceeded in number those recorded during the previous month, but they were, with a few exceptions, small (less than 30″ in diameter), and although pretty equally distributed between the two hemispheres, those to the south of the sun's equator presented a remarkable contrast, both in type and size, to those observed to the north of it; the former, as in June, included some large scattered groups and moderately sized spots of the normal class, while the latter consisted chiefly of solitary specks without penumbræ, and clusters of minute black punctures which frequently assumed very grotesque configurations. A striking feature of the large groups observed during the early part of the month was an evident tendency either to close up or to become dissociated upon reaching a certain position on the disc—about half way between the E. limb and the centre. On the 25th one of the largest groups observed this year appeared at the E. limb; on the 28th it measured nearly 5′ in length, and consisted of a large preceding spot 1′ 10″ in diameter, followed by a straggling train of "wispy" penumbræ enclosing several small spots. This group dwindled away very rapidly after the 28th. Another large spot, about 50″ in diameter, was observed from July 13th—25th.

Fresh groups observed in the sun's N. hemisphere during July	9
Fresh groups observed in the sun's S. hemisphere during July	12
Maximum number of groups on disc	12 (July 13, 5^h 30^m)
Minimum number of groups on disc	4 (July 28, 5^h 10^m)

Mr. Albert P. Holden, of London, says, "I observed a very interesting spot on June 21, at 7 A.M. The penumbra was unusually pale, and the umbra of a decided light brown hue. Four darker openings arranged in a square were observed in the umbra, and were readily seen with a very small aperture. A very remarkable circumstance in connection with the sun spots during the last two months has been their extremely light colour. The light brown tints of the umbra have been very marked, and totally different from the dark hues they usually present; while, at times, the penumbræ have been so light as to be scarcely visible. In most of them, however, the nucleus (which is ordinarily so difficult to detect) has been very easily seen, as in the case of the foregoing observation. The fact proves the phenomenon seen to be due to the actual lightening of the spots themselves, because if it were merely an optical or atmospheric effect, the whole spot would be lighter and the nucleus would be quite as difficult to detect as before. It is probable that these appearances may be a necessary result of the maximum of sun-spot activity, and are due (as suggested by Mr. Lockyer) to the thinness of the solar envelope at the present time. This would certainly account for the light hues of the umbræ and penumbræ, and also for the frequency and blackness of the nucleus." Mr. Henry Ormesher, of Manchester, writes, "On the 31st of July, from 2^h 15^m to 3^h 0^m, while looking at the sun with my 3 in. refractor, I saw a beautiful large cluster of spots occupying an almost central position on the disc. It occurred to me that the umbra in the largest spot appeared more dense on the western side. I therefore determined to examine it with my $5\frac{1}{4}$ in. refractor. I did so, using a power of 181. The result was that it resolved itself into a very fine nucleus of a somewhat oval shape. After making myself sure that the above was the case I examined the cluster generally, and was struck with the beautiful appearance of the brighter part of the sun's atmosphere. A very bright stream ran across the cluster, in a zigzag direction, separating the penumbra. Some parts of this stream, and particularly the upper part, appeared brighter than others, presenting a very mottled appearance."—Mr. William F. Denning, of Bristol, observed the sun, with his 3 in. refractor, on July 14, from 5^h 30^m to 6^h 10^m. He noticed nine large well-defined *maculæ* on various parts of the disc. A particularly large and interesting group of spots was visible in the N. hemisphere. On July 22, at 8 P.M., a spot was observed in the same hemisphere, which was divided by two bridges of light. He noticed that the penumbra was invaded by numerous minute lines of light, and that the bridges seemed to present the appearance of running matter. This observation was made with power 100 and $10\frac{1}{2}$ in. reflector by Browning.

The Lunar Eclipse of July 12.—The Rev. Ralph Prowde, of Northallerton, Yorkshire, observed this phenomenon, and has forwarded the following:—"I observed the eclipse of the moon

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on the 12th, but the only thing remarkable was the great contrast of shade between the darker and brighter penumbræ. I say penumbræ, for I suppose the real umbra of the earth's shadow falls within the moon's orbit. The darker interior cone of shadow obscured the edge of the moon and the object on its surface as it passed over them almost entirely, but its own edge did not seem to be nearly so regularly round as the lighter enveloping cone of shade."—The Rev. J. J. Johnson, of Crediton, reports:—"On the evening of the 12th I had a very favourable view of the lunar eclipse. The sky was clear at first, with a small amount of stratus near the horizon. I first caught sight of the moon at 8.41, but it was 8.49 before it got clear of the clouds. I paid particular attention to the degree of distinctness with which the eclipsed portion could be seen. When about four digits were covered I just noticed the copper tin through the telescope. I fancy this would be a little sooner than in the last eclipse I observed (September 1867) but in that of October 4, 1865, which was only of 4 digits, the copper tint was very decided in the telescope at the time of the greatest obscuration. When about six digits, or half the disc, was covered, the copper colour could be clearly seen with the naked eye. I could not make out any particular parts of the moon's surface until 9.35, when I noticed the *Mare Tranquillitatis* and the *Mare Serenitatis* showed with beautiful distinctness through the earth's shadow in the telescope. A few minutes after the total was attained, I was struck with the obscurity of the eastern side of the moon being so much more than I had expected. At 9.55 at least half of its surface was as if blotted out even when seen through the telescope, although I applied two different powers—70 and 150. Three of the *seas* at the western side were all I could make out. Possibly a thin coating of cirrus cloud which covered all the sky about this time might account in some measure for the invisibility of the moon. By 10.30 this had entirely cleared away, and the sky was everywhere covered with stars. The Milky Way very near the moon was about as distinct as it usually appears on a dark clear night. At this period, being the middle of the eclipse, the upper portion of the moon was the invisible part, all those regions lying round the margin of the disc being alone to be seen, except at the vertex, where the margin itself was not discernible. At 11.23 the first streak of light was breaking forth at the eastern edge. At 11.45 the red colour was nearly gone, and the eclipsed part appeared of a grey colour. At 11.58 I noticed there was no trace of the Milky Way; at 12.24 the lunar circle was again complete."—Mr. Oliver J. Lodge, of Hanley, reports that "the colour of the moon during the totality was of a most peculiar copper hue, giving very little light indeed. But during the egress of the shadow it was almost as white and silvery as it usually is, although still under the penumbra." Mr. Edmund Neison, of London, says:—"The colour of the eclipsed disc was during the whole time a dull, yellowish olive-green, both in the telescope and out, but was never dark enough to prevent many of the chief markings and craters being seen. From 10.44, when the lunar disc was fairly above the fog-banks, *Aristarchus* was quite distinct as a bright crater, and even before eleven *Grimaldi* was plainly discernible." At Bristol, Mr. William F. Denning observed the phenomenon, and remarks that even at the time of totality many of the most conspicuous objects on the disc were distinctly visible. The copper tint was also very evident. During a portion of the time the moon was overcast with clouds.

Venus.—Mr. Henry Ormesher, of Manchester, observed this planet with 5¼ in. equatorial refractor, on July 23, at 5h A.M. "The definition was excellent. I observed three dusky spots on the disc, one of which was of very considerable magnitude."

Saturn.—Mr. H. Michell Whitley, of Penarth, writes:—"July 7th, 10h 11m, power 208—the ball of the planet dull yellow colour. N. equatorial ruddy belt conspicuous, and another of same colour between it and pole; pole bluish grey; edges of disc fainter than centre; sky in ansæ much blacker than around planet; crape ring across ball nearly as dark as Ball's dension, pale purple; crape ring very easy in ansæ. No line of light between it and B."

Occultation.—Mr. J. C. Lambert, of Sleaford, witnessed the occultation of B.A.C. 5954 on July 10, and found the exact time of disappearance to be 12h 40m 41s mean time.

Meteors.—Mr. J. C. Lambert "observed a very brilliant meteor at 11h 40m, July 21. Course from a little below γ Cassiopeiæ to ξ Persei. Nucleus appeared as a star of 1·5 mag.; tail nearly 2° long; colour, yellowish white; duration 2s. During the time of observation (11h to 12h 30m) observed no less than eleven small meteorites. The course of one of these was from ε Bootis to 43 Comæ Berenicis, and immediately afterwards one from a little below 43 Comæ Berenicis to η Bootis. Could this have been one and the same meteor describing an arc?"

Lunar Observations.—Mr. H. Michell Whitley has very carefully examined many interesting lunar objects, and the results he obtained have been forwarded to Mr. W. R. Birt.

PARIS

Academy of Sciences, Aug. 16.—M. Yvon Villarceau communicated some remarks on the decimal division of angles and of time, in reference to M. l'Abbadie's communication of the previous week.—M. Sainte-Claire Deville made a final reply to M. Jamin on the subject of the sepecific heat of mixtures.—M. Wurtz presented a note by MM. Ad. Lieben and A. Rossi on normal amyl alcohol. The same authors recorded last year the manufacture of a new butyl alcohol differing from the alcohol of fermentation, and representing the fourth term in the homologous series of normal alcohols. Taking this alcohol for a point of departure, and applying the same synthetical methods, they succeeded in obtaining a new amyl alcohol, which they call normal, and bearing the same relation to the amyl alcohol already known as the new butyl alcohol does to the butyl alcohol of fermentation. In order to obtain it cyanide of normal butyl is first obtained, and the valeric acid corresponding to it made by the oxidation of ordinary amyl alcohol. The lime-salt of normal valeric acid is mixed with the formiate, and the mixture submitted to dry distillation. Valeric aldehyde is thus obtained, boiling at about 102°, and isomeric with valeral. This aldehyde, treated with nascent hydrogen, yields the alcohol. Normal amyl alcohol bears a strong resemblance to the amyl alcohol of fermentation. It is distinguished by its higher boiling point, 137°. By oxidation it yields valeric acid.—M. Wurtz also presented a note by M. F. Papillon on modifications in the immediate composition of bones, proving that the normal lime contained in the bones of animals may be partially replaced by alumina, magnesia, or strontia, by including these substances in their food.—M. Cave contributed a note on the formative zone of the foliar organs in monocotyledonous vegetables. This he found to occupy the same position as in his previous researches on dicotyledonous plants. In the leaves of endogenous plants the inferior tissue is the older; the layer nearer to the superior epidermis is the younger. In the fruits, also, the author has invariably found the formative zone occupy the same place in those belonging to the two divisions of flowering plants.—M. Jamin presented a note by M. W. de Fonvielle on the astronomical discoveries of the ancients.

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